mined to establish in London, Dr. Hofmann proceeds to a narrative of the difficulties experienced by the new school in the deficiency of the money received from the fees of students to meet the necessary expenses as well as the debt incurred by the outlay for building. At this stage the college narrowly escaped the entire abandonment of its primary object, the advancement of science by means of practical instruction and original researches, to sink into a mere commercial undertaking for conducting analyses. To the influence of Sir James Clark, one of the earliest friends of the College, was mainly due the ultimate success of the efforts of the Council to induce the Government to adopt the College as the chemical department of the Museum of Practical Geology; since which period its career of usefulness has been unchecked.—Dr. A. E. Sansom follows with an article on "The Theory of Atmospheric Germs," in which he records the investigations on this subject which have been conducted to the present time, especially those of Hallier and Bastian; and sums up adversely to the theory of abiogenesis.—Mr. Mungo Ponton, in his short paper on Molecules, Ultimates, Atoms, and Waves, suggests the use of the term "molecule" to denote the particles of chemical compounds; "ultimate," those of chemical elements; and "atom," the assumed constituents of those ultimates, themselves incapable of further analysis.—Prof. Piazzi Smyth occupies no less than thirty-eight pages with the conclusion of his article on "The Great Pyramid of Egypt from a modern scientific Point of View."—Sir William Fairbairn has some very practical remarks on Steam Boiler Legislation, in which he details the failure of voluntary associations for the purpose of diminishing the loss of life and property occasioned by the use of defective boilers, and advocates the enforced legal testing of boilers by competent authorities, maintaining that it is clearly the duty of the Government to interfere on behalf of those whose lives are jeopardised, and to enact that no boiler shall be worked unless periodically examined and certified.—The last article is an account of the Eclipse of last December, by Mr. R. A. Proctor. Notices of books and a record of the progress of science in the departments of light, heat, electricity, meteorology, mineralogy, mining, metallurgy, engineering, geology and palæontology, and botany, fill up a very good number.

THE numbers of the *American Naturalist* for March and April contain some good articles. The Polarity of the Compass Plant (*Silphium laciniatum*) is a subject which has recently attracted attention, and Mr. W. F. Whitney's short article under this title sums up what is at present known about its causes.—Mr. J. A. Allen's paper in a previous number on "The Flora of the Prairies" is followed by one on "The Fauna of the Prairies."—Dr. G. H. Perkins describes some interesting relics of the Indians of Vermont, illustrated with woodcuts.—Mr. F. W. Vogel has an article on the Principles of Bee Breeding.—Mr. E. L. Greene gives an account of the Spring Flowers of Colorado.—Mr. W. Wood has a valuable article on the Game Falcons of New England; and Dr. A. S. Packard, jun., one on Bristle-tails and Spring-tails, the Lepismas and Poduras, illustrated by plates, and containing a very full account of this interesting family. In both numbers are also reviews of recent works on natural history, and many interesting paragraphs of intelligence under the heads of botany, zoology, geology, anthropology, and microscopy, original or compiled, from American and foreign sources.

SOCIETIES AND ACADEMIES

LONDON

Royal Society, April 27.—"On the Increase of Electrical Resistance in Conductors with rise of Temperature, and its application to the Measure of Ordinary and Furnace Temperatures; also on a simple Method of measuring Electrical Resistances." By C. W. Siemens, F.R.S., D.C.L.

The first part of this paper treats of the question of the ratio of increase of resistance in metallic conductors with increase of temperature.

The investigations of Arndtson, Dr. Werner Siemens, and Dr. Matthiessen are limited to the range of temperatures between the freezing and boiling-points of water, and do not comprise platinum, which is the most valuable method for constructing pyrometric instruments.

Several series of observations are given on different metals, including platinum, copper, and iron, ranging from the freezing-point to 350° Cent.; another set of experiments being also given, extending the observations to 1000° Cent. These results are planned on a diagram, showing a ratio of increase which does not agree either with the former assumption of a uniform progression, or with Dr. Matthiessen's formula, except between the narrow limits of his actual observations, but which conforms itself to a parabolic ratio, modified by two other coefficients, representing linear expansion and an ultimate minimum resistance.

In assuming a dynamical law, according to which the electrical resistance of a conductor increases according to the velocity with which the atoms are moved by heat, a parabolic ratio of increase of resistance with increase of temperature follows; and in adding to this the coefficients just mentioned, the resistance r for any temperature is expressed by the general formula,

$$r=\alpha T^{\frac{1}{2}}+\beta T+\gamma,$$

which is found to agree very closely both with the experimental data at low temperatures supplied by Dr. Matthiessen, and with the author's experimental results, ranging up to 1000° Cent. He admits, however, that further researches will be necessary to prove the applicability of the law of increase expressed by this formula to conductors generally.

In the second part of this paper it is shown that, in taking advantage of the circumstance that the electrical resistance of a metallic conductor increases with an increase of temperature, an instrument may be devised for measuring with great accuracy the temperature at distant or inaccessible places, including the interior of furnaces, where metallurgical or other smelting operations are carried on.

In measuring temperatures not exceeding 100° Cent., the instrument is so arranged that two similar coils are connected by a light cable containing three insulated wires. One of these coils, "the thermometer-coil," being carefully protected against moisture, may be lowered into the sea, or buried in the ground, or fixed at any elevated or inaccessible place whose temperature has to be recorded from time to time; while the other, or "comparison-coil," is plunged into a test-bath, whose temperature is raised or lowered by the addition of hot or cold water, or of refrigerated solutions, until an electrical balance is established between the resistances of the two coils, as indicated by a galvanoscope, or by a differential voltameter, described in the second paper, which balance implies an identity of temperature at the two coils. The temperature of the test-solution is thereupon measured by means of a delicate mercury thermometer, which at the same time tells the temperature at the distant place.

By another arrangement the comparison-coil is dispensed with, and the resistance of the thermometer-coil, which is a known quantity at zero temperature, is measured by a differential voltameter, which forms the subject of the second paper; and the temperature corresponding to the indications of the instrument is found in a table, prepared for this purpose, in order to save all calculation.

In measuring furnace temperatures the platinum-wire constituting the pyrometer is wound upon a small cylinder of porcelain contained in a closed tube of iron or platinum, which is exposed to the heat to be measured. If the heat does not exceed a full red heat, or, say, 1000° Cent., the protected wire may be left permanently in the stove or furnace, whose temperature has to be recorded from time to time; but in measuring temperatures exceeding 1000° Cent., the tube is only exposed during a measured interval of, say, three minutes, to the heat, which time suffices for the thin protecting casing and the wire immediately exposed to its heated sides, to acquire within a determinable limit the temperature to be measured, but is not sufficient to soften the porcelain cylinder upon which the wire is wound. In this way temperatures exceeding the welding-point of iron, and approaching the melting-point of platinum, can be measured by the same instrument by which slight variations at ordinary temperatures are told. A thermometric scale is thus obtained embracing without a break the entire range.

The leading wires between the thermometric coil and the measuring instrument, which may be under certain circumstances several miles in length, would exercise a considerable disturbing influence if this were not eliminated by means of the third leading wire before mentioned, which is common to both branches of the measuring instrument.

Another source of error in the electrical pyrometer would arise through the porcelain cylinder upon which the wire is wound becoming conductive at very elevated temperatures; but it is shown that the error arising through this source is not of serious import.

The third part of the paper is descriptive of an instrument for measuring electrical resistance without the aid of a magnetic needle or of resistance scales. It consists of two voltameter tubes fixed upon graduated scales, which are so connected that the current of a battery is divided between them, with one branch including a known and permanent resistance, and the unknown resistance to be measured. The resistance and polarisation being equal, and the battery being common to both circuits, these unstable elements are eliminated by balancing them from the circulation, and an expression is found for the unknown resistance X in the known resistances C and γ of the voltameter, including the connecting wires and the volumes V and V′ of gases evolved in an arbitrary space of time within the tubes, viz. :—

$$X = \frac{V}{V'}(C + \gamma) - \gamma \quad . \quad . \quad . \quad . \quad . \quad (1)$$

Changes of atmospheric pressure affect both sides equally, and do not therefore influence the results; but a reading of the atmospheric pressure is obtained at both sides by lowering the little supply reservoir with dilute acid to the level indicated in the corresponding tube. The upper ends of the voltameter tubes are closed by small weighted levers provided with cushions of india-rubber; but after each observation these levers are raised, and the supply reservoirs moved so as to cause the escape of the gases until the liquid within the tubes is again brought up to the zero line of the scale, when the instrument is ready for another observation. A series of measurements are given of resistances varying from 1 to 10,000 units, showing that the results agree within one per cent. with the independent measurements obtained of the same resistances by the Wheatstone method.

The advantages claimed for the proposed instrument are, that it is not influenced by magnetic disturbances, or the ship's motion if used at sea; that it can be used by persons not familiar with electrical testing; and that it is extremely simple and easily procured.

Royal Institution of Great Britain, Annual Meeting, Monday, May 1.—Sir Henry Holland, Bart., F.R.S., president, in the chair. The Annual Report of the Committee of Visitors for the year 1870 was read and adopted. Eighty-one new members were elected in 1870. Sixty-three lectures and nineteen evening discourses were delivered during the year 1870. The books and pamphlets presented in 1870 amounted to 118 volumes, making, with those purchased by the managers, a total of 307 volumes added to the library in the year, exclusive of periodicals. Thanks were voted to the president, treasurer, and secretary, to the committees of managers and visitors, and to the professors, for their services to the Institution during the past year. The following gentlemen were unanimously elected as officers for the ensuing year: President—Sir Henry Holland, Bart., F.R.S. Treasurer—Mr. William Spottiswoode, F.R.S. Secretary—Dr. Henry Bence Jones, F.R.S. Managers—Mr. John J. Rigsby, F.R.S.; Mr. George Berkley, Mr. William Bowman, F.R.S., Mr. George Busk, F.R.S., Mr. Warren De la Rue, F.R.S., Capt. Douglas Galton, C.B., F.R.S., Mr. John Hall Gladstone, F.R.S., Mr. William Robert Grove, F.R.S., the Lord Lindsay, Mr. George Macilwain, the Duke of Northumberland, William Pole, F.R.S., Sir W. Frederick Pollock, Bart., Mr. Robert P. Roupell, Col. Philip James Yorke, F.R.S.

Geological Society, April 5.—Prof. Morris, vice-president, in the chair. The following communications were read:—1. "On a new Chimæroid Fish from the Lias of Lyme Regis," by Sir Philip Grey Egerton, Bart., M.P., F.RS. The fish for which the author proposed the name of *Ischyodus orthorhinus*, was represented by a specimen showing the anterior structures imbedded in a slab of Lias. It exhibited the characteristic dental apparatus of the Chimæroids, surrounded with shagreen, a very large prelabial appendage six inches long, and terminating in a hook abruptly turned downwards, and a process which the author regarded as representing the well-known rostral appendage of the male Chimæroid, but in this case attaining a length of 5½ inches, and covered more or less thickly with tubercles, bearing recurved central spines somewhat toothlike in their aspect. This appendage is attached to the head by a rounded condyle, received into a hollow in the frontal cartilage. The dorsal spine, which measured 6 inches in length, was articulated by a rounded surface to a strong cartilaginous plate projecting upwards from the notochordal axis, and was thus rendered capable of a considerable amount of motion in a vertical plane. This structure also occurred in *Callorhynchus* and *Chimæra*. Dr. Günther commented on the interest of this discovery, as in no other sharks is the same articulation of the dorsal spine as that described in the paper to be found. He inquired whether the granulated plate supposed to be dorsal might not be a part of the armature of the lateral line, as in sturgeons. He thought that the Chimæroids would eventually prove to be intermediate between the ganoid and shark types, and that all belonged to one subclass. Mr. Gwyn Jeffreys inquired what other remains were found with these fishes such as might represent the food, molluscan or otherwise, on which they lived. Sir P. Egerton replied that there was no deficiency of pabulum for any kind of fish in the sea represented by the Lias of Lyme Regis. He also made some remarks on another somewhat similar specimen in his own museum. The plate referred to by Dr. Günther, he stated, was symmetrical, and not like the lateral plates on the sturgeon, which are unsymmetrical. He therefore thought it dorsal.—2. "On the Tertiary Volcanic Rocks of the British Islands," by Archibald Geikie, F.R.S. In this communication the author gave the first of a series of papers which he proposes to lay before the society upon the volcanic rocks of Britain of later date than the chalk. In a general introduction to the whole subject, he pointed out the area occupied by the rocks, showing that they are chiefly developed along the broad tract which extends from the south of Antrim, between the chain of the Outer Hebrides and the mainland of Scotland, up into the Faroe Islands, and even to Iceland. The nomenclature of the rocks was discussed, and the following arrangement was proposed:—

	Felspathic series					Pyroxenic, or Augitic.					
	Syenite	Felstone and Quartz porphyry.	Trachyte and Trachyte-porphyry.	Pitchstone.	Porphyrite.	Dolerite	Basalt.	Trachylite.	Diallage-rock ? altered dolerite.	Felspathic tuffs.	Pyroxenic tuffs and agglomerate.
I. INTERBEDDED OR CONTEMPORANEOUS.											
A. *Crystalline.*											
Sheets or beds	...	...	?	*	*	*	*	...	*		
B. *Fragmental.*											
Beds or layers	...	...	...	...	..	...	...	...	...	?	*
II. INTRUSIVE OR SUBSEQUENT.											
A. *Crystalline.*											
α. Amorphous masses	*	*	?	...	...	?					
β. Sheets	...	...	...	...	...	*	*				
γ. Dykes and veins	*	*	?	*	...	*	*	*			
δ. Necks	...	?	...	...	...	...	?				
B. *Fragmental*											
Necks	...	...	...	...	...	...	...	...	...	...	*

The age of the rocks was shown to be included in the Tertiary period by the position of the volcanic masses above the chalk, and by their including beds containing Miocene plants. As an illustrative district, the author described the volcanic geology of the island of Eigg, one of the Inner Hebrides, and brought out the following points:—1. The volcanic rocks of this island rest unconformably upon strata of Oolitic age. 2. They consist almost wholly of a succession of nearly horizontal interbedded sheets of dolerite and basalt, forming an isolated fragment of the great volcanic plateau which stretches in broken masses from Antrim through the Inner Hebrides. 3. These interbedded sheets are traversed by veins and dykes of similar materials, the dykes having the characteristic north-westerly trend, with which they pass across the southern half of Scotland and the north of England. Veins of pitchstone and felstone, and intrusive masses of quartziferous porphyry, like some of those which in Skye traverse or overlie the lias, likewise intersect the bedded dolerites and basalts of Eigg. 4. At least, two widely separated epochs of volcanic activity are represented by the volcanic rocks of Eigg. The older is marked by the bedded dolerites and by the basalt veins and dykes which, though strictly speaking younger than the bedded sheets which they intersect, yet probably belong to the same continuous period of volcanic action. The later manifestations of this action are shown by the pitchstone of the Scùr. Before that rock was erupted the older doleritic lavas had long ceased to flow in this district. Their successive beds, widely and deeply eroded by atmospheric waste, were here hollowed into a valley traversed by a river, which carried southward the drainage of the wooded northern hills. Into this valley, slowly scooped out of the older volcanic series the pitchstone and porphyry *coulées* of the Scùr flowed. Vast, therefore, as the period must be which is chronicled in the huge piles of volcanic beds forming our dolerite plateaux, we must add to it the time needed for the excavation of parts of those plateaux into river-valleys, and the concluding period of volcanic activity during which the rocks of the Scùr of Eigg were poured out. 5. Lastly, from the geology of this interesting island we learn, what can be nowhere in Britain more eloquently impressed upon us, that, geologically recent as that portion of the Tertiary periods may be during which the volcanic rocks of Eigg were produced, it is yet separated from our own day by an interval sufficient for the removal of mountains, the obliteration of valleys, and the excavation of new valleys and glens where the hills then stood. The amount of denudation which has taken place in the Western Islands since Miocene times will be hardly credible to those who have not adequately realised the potency and activity of the powers of geological waste. Subterranean movements may be called in to account for narrow gorges, or deep glens, or profound sea-lochs; but no subterranean movement will ever explain the history of the Scùr of Eigg, which will remain as striking a memorial of denudation as it is a landmark amid the scenery of our wild western shores. Prof. Haughton inquired whether Mr. Geikie's attention had been called to the Morne Mountains in Ireland, which seemed to present some analagous phenomena to those described in the paper. In the Morne district were dykes of dolerite, pitchstone, and other volcanic rocks of the same constitution as those of Antrim. He believed that a chemical examination of these rocks in different districts would prove their common origin. The evidence in Antrim was conclusive as to their Tertiary age in Ireland, and he was glad to find that the view of their belonging to a different age in Eigg was erroneous. Prof. Ramsay had hitherto believed in the Oolitic age of these trap-rocks in Eigg, but accepted the author's views. The interbedding of volcanic beds among the Lower Silurian beds in Wales was somewhat analogous. He was glad to find the history of these igneous rocks treated of in so geological a manner, instead of their being regarded from too purely a lithological and mineralogical point of view. The great antiquity of these Middle Tertiary Beds had, he thought, been most admirably brought forward in the paper, as well as the enormous amount of denudation; and he would recommend it to the notice of those who had not a due appreciation of geological time. Mr. Forbes hoped that the geologist would remember that his father was a mineralogist. It was refreshing to find a paper of this kind brought before the Society, as it was to be regretted that the details of mineralogy were so little studied in this country when compared with the Continent; and this he attributed to the backward state of petrology (admitted by Mr. Geikie) in this country. He quite agreed in the view of the Tertiary age of these rocks. With regard to the terminology employed by the author, he objected to the use of the word dolerite, as distinct from basalt; basalt properly comprised, not only dolerite, the coarse-grained variety, and anamezite, the finely-grained variety, and the true basalt, but also trachylite, which was frequently confounded with pitchstone. All four names merely referred to structure, and not to composition. Mr. Geikie, in reply, stated that he had not examined the Morne Mountains. He had not in any way wished to disparage mineralogy, but, on the contrary, had attempted to classify the different rocks according to their petrological character. He used the term dolerite in the same sense as the German mineralogists, both as the generic name for the whole series, and also for the coarser variety of basalt. 3. "On the formation of 'Cirques,' and their bearing upon theories attributing the excavation of Alpine Valleys mainly to the action of Glaciers," by the Rev. T. G. Bonney, M.A., F.G.S. The paper described a number of these remarkable recesses, which, though not restricted to the limestone districts of the Alps, are best exhibited in them. The author gave reasons why he could not suppose them to have been formed either as craters of upheaval, or by the action of the sea, or by glacial erosion. With regard to the last he showed that, even if glaciers had been the principal agents in excavating valleys, there were some cirques which could not have been excavated by them; and then went on to argue from the fact that glaciers had occupied cirques, and from the relation between them and the valleys, that they could not be attributed to different agents. He also showed that commonly the upper part of the valley, where the erosive action is perhaps least, is very much the steepest, and urged other objections to the great excavatory powers often attributed to glaciers. He then described one or two cirques in detail, and showed that they were worked out by the joint action of many small streams, and of the usual meteoric agents working upon strata whose configuration was favourable to the formation of cliffs. Mr. Whitaker suggested an analogy between the cirques and the combes in our own limestone countries. Mr. Geikie regarded the cirques as analogous with the combes of Wales and the corries of Scotland. They were not, however, confined to limestone districts, but occurred also in gneiss and granite rocks. He thought that the shape was much influenced by the bedding and jointing of the rocks, as there was an evident connection between these and the shape of the combes. He could not, however, see his way to account for the vertical cliffs surrounding the cirques. The Rev. T. G. Bonney, in reply, observed that though cirques were not confined to limestones, the finest instances occurred in such rocks. When cirques occurred in crystalline rocks, the talus was usually much larger than in limestone.—The following specimens were exhibited: Specimens of Fossil Fish-remains from the Lias of Lyme Regis; exhibited by Sir P. de Malpas Grey Egerton, in illustration of his paper.

Royal Society of Literature, April 26.—Mr. Hyde Clarke read a paper on the "Classic Names of Rivers," more particularly in Greece, Asia Minor, and Italy. After referring to the discoveries in the stone period by Mr. Finlay and others, and to the megalithic and cyclopean structures, he proceeded to consider what evidence was afforded by topographical nomenclature of the populations which preceded the Hellenic. He showed that the river-names in the classic regions conformed with each other, and that this was not attributable, as supposed, to Hellenic colonisation. These names also conform to those of India, and of the ancient world generally; but the explanation was not to be found in Aryan etymologies, but that it was to be sought in earlier forms. These are represented in the languages of the Caucasus, of which the Georgian, Suan, Latian, and Lesghian afford examples now. With these the Thracian and the languages of Asia Minor corresponded. The local facts gave colouring to the legends of the occupation and invasion of Attica by the Amazons, and of the existence in Europe of a Thracian population allied to that of Asia. The eastern connection of the Etruscan and Italian populations, too, was to be accounted for as with the Caucasus, and not with America. He referred likewise to the influence of the river-names on classic mythology, and particularly on the nomenclature of Tartarus.

Linnean Society, April 20.—Notes on Mr. Murray's paper on the Geographical Relations of the chief Coleopterous Faunæ, by Dr. Roland Trimen. The author considered that the argument of a continuity of land at a previous epoch is too often resorted to to explain the occurrence of the same species of insects in widely remote countries. He entered in considerable detail into the chief features of the distribution of the genera and species of Coleoptera, especially at the Cape; laying much stress on the difficulty which introduced species find in establishing themselves in soil already well stocked.

Society of Biblical Archæology, April 4.—Dr. S. Birch, F.S.A., president, in the chair.—Mr. Henry Theodore Bagster, Mr. Richard Bosanquet, Mr. A. W. Franks, M.A., V.P.S.A., &c., and Mr. Burnett Tabrum were duly elected members of the society. The Secretary read a paper communicated by Mr. Henry Fox Talbot, F.R.S., &c., "On an Eclipse mentioned on an Assyrian Tablet." The tablet in question is preserved in the British Museum, and is marked 154 and 122*b*. The translation runs thus: "To the King of the World—My Lord, Thy servant, Kukuru, sends this:—May Assur, the Sun, and Marduk be propitious to my Lord the King in his journey from his kingdom to the land of Egypt! I inform his Majesty that in the month of Su there was an Eclipse. Five portions of the full orb were obscured. Let the King be of tranquil mind, since the eclipse of the month of Su portends good fortune to the King." The translator proceeded to identify this eclipse thus recorded with one which took place in the seventh warlike expedition of Assurbanissal against Tiumman, King of Elam. The next meeting was then announced to take place on Tuesday, 2nd proximo, to which date the meeting was then adjourned.

DUBLIN

Royal Irish Academy, April 10.—Rev. T. H. Jellett, president, in the chair. Prof. Hennessy, F.R.S., read a paper On the Floatation of Sand by the incoming tide at the Mouth of a Tidal River. During the course of a tour along our western coast, in the summer of 1868, the following incident came under my notice; and, although I made a note of the facts at the time, I have never hitherto made them the subject of a scientific communication: On July 26, when approaching the strand at the river below the village of Newport, County Mayo, I noticed what appeared to be extensive streaks of scum floating on the surface of the water. As it was my intention to bathe, I was somewhat dissatisfied with the appearance of the water, until I stood on the edge of the strand, and I then perceived that what was apparently scum, seen from a distance, consisted of innumerable particles of sand, flat flakes of broken shells, and the other small *débris* which formed the surface of the gently-sloping shore of the river. The sand varied from the smallest size visible to the eye up to little pebbles, nearly as broad and a little thicker than a fourpenny piece. Hundreds of such little pebbles were afloat around me, and it is probable that the flakes of floating matter seen farther off contained also a considerable proportion. The air during the whole morning was perfectly calm, and the sky cloudless, so that, although it was only half-past nine, the sun had been shining brightly for some hours on the exposed beach. The upper surface of each of the little pebbles was perfectly dry, and the groups which they formed were slightly depressed in curved hollows of the liquid. The tide was rapidly rising, and, owing to the narrowness of the channel at the point where I made my observations, the sheets of floating sand were swiftly drifting farther up the river into brackish and fresh water. On closely watching the rising tide at the edge of the strand, I noticed that the particles of sand, shells, and small flat pebbles, which had become perfectly dry and sensibly warm under the rays of the sun, were gently uplifted by the calm, steadily-rising water, and then floated as readily as chips or straws. I collected a few specimens of these little objects, but I regret that they have been since mislaid. This phenomenon, it is scarcely necessary to say, is due to molecular action, such as accompanies the familiar experiment of floating needles on the surface of a basin of water. Although the specific gravity of the floating objects exceeds that of the fluid on which they rest, the principle of Archimedes still holds good, because the displacement of liquid produced by the body is considerably greater than the volume of the body itself. In the case of a floating needle, the repulsion of the liquid from the polished surface of the metal presents a groove, whose magnitude is obviously many times greater than the needle; but in the case of the floating pebbles this was not so manifest. The attraction of the molecules of water for one another produces, as is well established, a tension at the surface of the liquid, which, although extremely feeble, and generally noticed only in connection with capillary phenomena, yet interposes some resistance to the intrusion of foreign substances. I have floated small flat pebbles, similar in size and appearance to the largest of those observed floating on Newport river, for more than six days, while fragments of shells, and thin pieces of slate as broad as a sixpenny-piece, have continued to float much longer. These little bodies occasionally sank from the gradual absorption of water, but much more frequently from some accidental motion of the vessel containing the liquid. It is manifest that the floatation of sand in a tidal estuary, as in the instance I have seen, can occur only under favourable conditions. The shores must be very gently inclined, the air perfectly calm, and the weather dry and warm. Under these circumstances thin cakes or sheets of sand may not only be uplifted by the water, but if the tide flows rapidly they may continue to float sufficiently long to allow many of them to be drifted far from their original place up to the higher limit of the brackish water. In this way fragments of marine shells and exuviæ might become mingled with those belonging to fresh water. The conditions favourable for sand floatation must exist during calm weather in a very high degree of perfection on the sandy shores of tidal rivers in tropical and subtropical districts of the earth. As this phenomenon can take place only with the rising tide, and never with the falling tide, the result must generally be favourable to the transport of sand and marine *débris* in the direction of the flow of flood tide; and this may sometimes hold good along a coast as well as on the shores of a tidal estuary. Geologists, as far as I am aware, have not hitherto noticed this phenomenon in connection with the formation of stratified deposits by the agency of tides and rivers, although they have paid great attention to the influence of the molecular resistance of water to the sinking of very minute solid substances, with the view of explaining the wide surface over which matter held in suspension by water may be spread when ultimately deposited over the sea bottom.—Prof. W. King read a paper, by himself and Prof. Rowney, "On the Mineral Origin of the so-called *Eozoon Canadense*." It was resolved to purchase the Bell and Bell-Shrine of St. Patrick, from Dr. C. Todd, for the sum of 500*l*.

BOOKS RECEIVED

ENGLISH.—Travels in the Air: J. Glaisher, 2nd edition (R. Bentley).—The Natural History of Plants: H. Baillon, vol. 1, translated by N. Hartog (L. Reeve and Co.).—Primitive Culture, 2 vols.: E. B. Tylor (J. Murray).—On Aphaxia, or Loss of Speech: Dr. F. Bateman (Churchill).

FOREIGN.—(Through Williams and Norgate)—Archiv für Anthropologie, vol. iv.—Zeitschrift der oesterreichischen Gesellschaft für Meteorologie, vol. v.—Compendium der chirurgischen Pathologie u. Therapie: Dr. C. Heitzmann.

DIARY

THURSDAY, MAY 4.

ROYAL SOCIETY, at 8.30.—On the Structure and Affinities of the Gwynia Annulata (Dunc.), with Remarks upon the Persistence of Palæozoic Types of Madreporaria: Prof. Duncan, F.R.S.—On Molybdates and Vanadates of Lead, and on a new Mineral from Leadhills: Dr. A. Schrauf.

SOCIETY OF ANTIQUARIES, at 8.30.—Roman Villa at Beddington: J. Addy.—Antiquities from Cyprus: J. B. Sandwith.

LINNEAN SOCIETY, at 8.—The phenomena of Protective Mimicry, and its bearing on the Theory of Natural Selection as illustrated by the Lepidoptera of the British Islands: Raphael Meldola, F.C.S.—On the Ascalaphidæ: R. McLachlan.

CHEMICAL SOCIETY, at 8.—On the Productive Powers of Soils in relation to the Loss of Plant Food by Drainage: Dr. Voelcker, F.R.S.

ROYAL INSTITUTION, at 3.—On Sound: Prof. Tyndall.

LONDON INSTITUTION, at 7.30.—On Economic Botany: Prof. Bentley.

FRIDAY, MAY 5.

GEOLOGISTS' ASSOCIATION, at 8.—On the Fauna of the Carboniferous Epoch: H. Woodward, F.G.S.

ROYAL INSTITUTION, at 9.—On Russian Folk-Lore: W. R. S. Ralston.

SATURDAY, MAY 6.

ROYAL SCHOOL OF MINES, at 8.—Geology: Dr. Cobbold.

ROYAL INSTITUTION, at 3.—On the Instruments Used in Modern Astronomy: J. N. Lockyer, F.R.S.

MONDAY, MAY 8.

ROYAL GEOGRAPHICAL SOCIETY, at 8.30.

ROYAL INSTITUTION, at 2.—General Monthly Meeting.

LONDON INSTITUTION, at 4.—On Astronomy: R. A. Proctor, F.R.A.S. (Educational Course.)

TUESDAY, MAY 9.

PHOTOGRAPHIC SOCIETY, at 8.

ROYAL INSTITUTION, at 3.—On Force and Energy: Charles Brooke, F.R.S.

WEDNESDAY, MAY 10.

SOCIETY OF ARTS, at 8.—On the Application of Steam to Canals: Geo. Edward Harding, C.E.

GEOLOGICAL SOCIETY, at 8.—On the Ancient Rocks of the St. David's Promontory, South Wales, and their Fossil Contents: Prof. R. Harkness, F.R.S., and Henry Hicks.—On the Age of the Nubian Sandstone: Ralph Tate, F.G.S.—On the Discovery of the Glutton (*Gulo luscus*) in Britain: W. Boyd Dawkins, F.R.S.

THURSDAY, MAY 11.

ROYAL SOCIETY, at 8.30.

SOCIETY OF ANTIQUARIES, at 8.30.

MATHEMATICAL SOCIETY, at 8.—On the Singularities of the Envelope of a non-Unicursal Series of Curves: Prof. Henrici.

ROYAL INSTITUTION, at 3.—On Sound: Prof. Tyndall.

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